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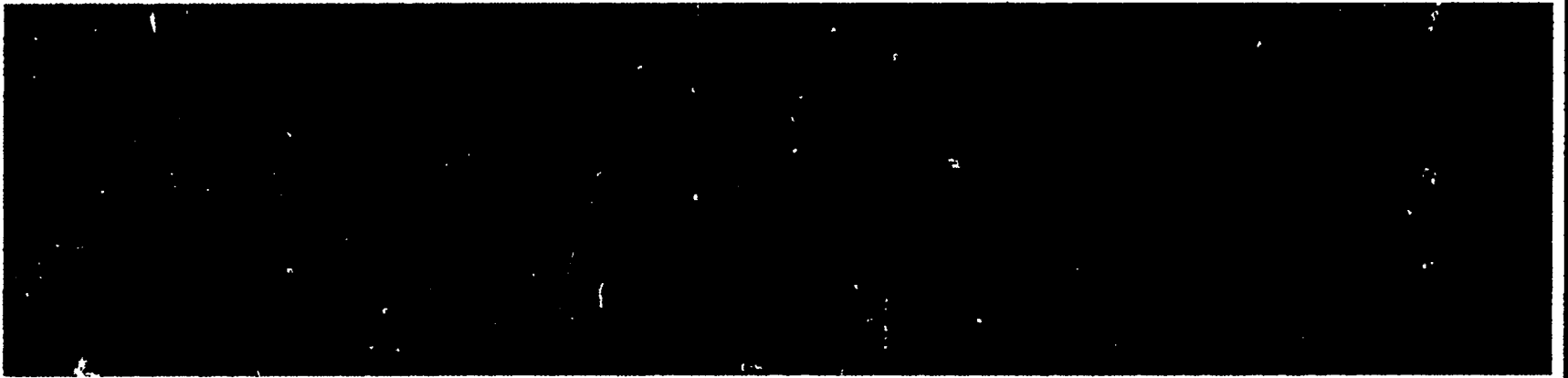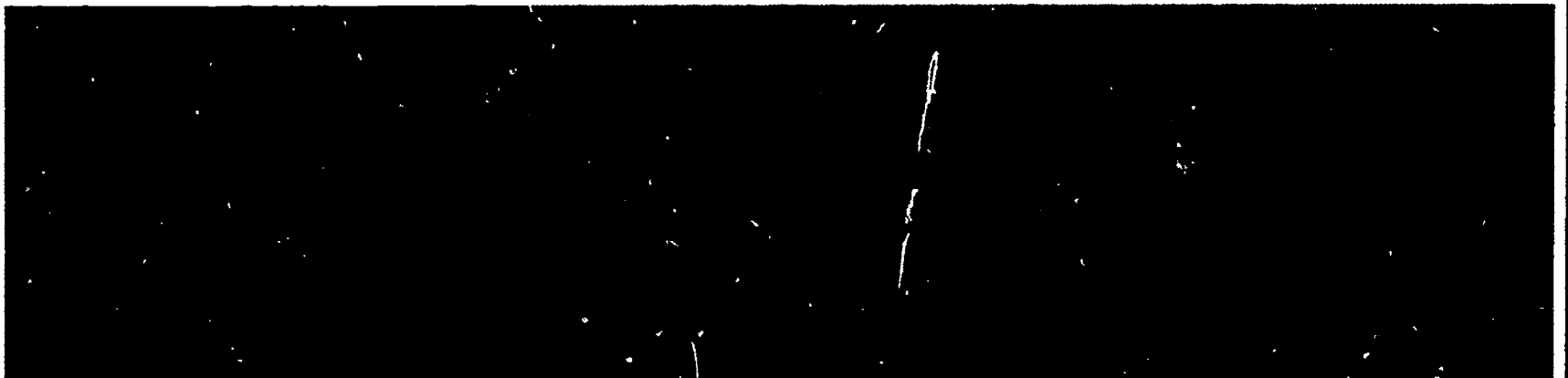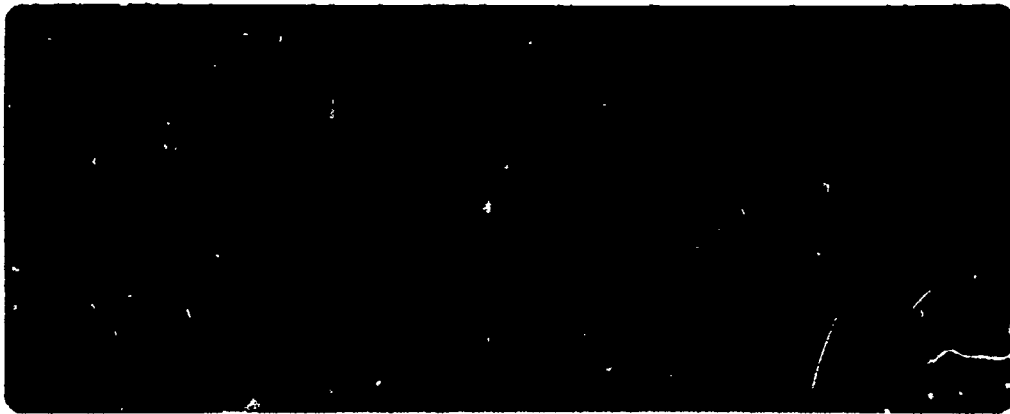   of Telecommunications Policy

ABSTRACT
            This paper summarizes an extensive report on the
development of a design using proven technology to demonstrate
innovative and cost-effective means of using telecommunications in
public service delivery. The conceptual approach of the study is
briefly discussed. Seven "service packages," proposing uses of
telecommunications in health, education and social service are
described. The hardware and service costs, potential institutional
constraints, cost benefit considerations, public policy issues, and
possible implementation barriers are reviewed. Illustrative charts
provide quick interpretation of the various proposals. (SK)

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A Planning Study to Develop a
Demonstration Design for the Use of
Telecommunications in
Public Service Delivery

EXECUTIVE SUMMARY
June 30, 1974

Submitted to:

Office of Telecommunications Policy
Department of Health, Education and Welfare
North Building
Room 5524
330 Independence Avenue, S. W.
Washington, D.C. 20201

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INTRODUCTION

Over the past several years, there have been many
attempts by both Federal, state, and local governments, as
well as by private foundations and other institutions, to
describe and place into perspective the potential that tele-
communications offers for increased public service delivery.
To say the least, the results have been mixed. Several
projects were funded as a result of various planning studies
and many of these efforts have successfully demonstrated the
utility of telecommunications technology in service delivery
within their given context. Other projects have shown that
due to institutional constraints, "human factors," or inappro-
priate technology utilization, telecommunications has been a
less than satisfactory answer to the problem. In other words,
planning studies and actual demonstrations have run the gamut
from success to failure, and have examined the range of tech-
nological options. Thus, the status of further examination
remains unclear. The National Science Foundation's recently
funded studies of two-way interactive applications of tele-
communications to social services have attempted to make the
leap from generalized planning to actual comprehensive service

delivery projects, and this is indeed a step to be commended.
So too, the study that is reported herein is hopefully a stride
in the direction of reality.

Part of the mandate of the Department of Health,
Education, and Welfare, Office of Telecommunications Policy,
was that Abt Associates develop a design using proven tech-
nology to demonstrate innovative and cost-effective means of
service delivery. As a result our approach was to focus on
the need and market for particular services, so as to avoid
the perennial scenarios of "technological solutions in search
of social problems". When looked at more carefully, many of
the solutions were not as appropriate as first envisioned; how-
ever, the problems required very little search, for they have
been and continue to be readily apparent. Lack of social
services to the rural isolated and urban poor need not be
documented, nor are the failures of the education and health
care systems in this country especially elusive.

Too frequently, telecommunications is viewed not only
as a panacea for the alleviation of social ills, but also as
a means of unearthing service needs that had not been previously
recognized. This is surely not the case. In fact, one of the
hard truths that must be faced by telecommunications planners
is the limitations of the technological applications that are
being suggested. A corollary to this is that not all "tradi-
tional" service delivery mechanisms have failed. Often with

additional resources, traditional service delivery mechanisms
have proven to be extremely effective, precluding the need
for increased technology and reaffirming the "human factor"
aspect of service delivery.

Possible service needs and related target populations
have been chosen on the basis of nationally recognized problems,
as shown in government literature, priorities of social service
agencies, and general public opinion. The Telecommunications
User Advisory Committee, formed for this study, was composed
of individuals with experience in social service delivery and
telecommunications applications (see Appendix A). This group
was extremely helpful in specifying target populations with
prime needs which might be effectively met through telecommun-
ications-based service delivery systems. The Committee also
identified groups which now receive inadequate or no social
services as the most important targets for the demonstration
project, in particular specifying minority group members, non-
English speakers, public assistance recipients, the elderly,
the handicapped, the poor, and those who are socially and
economically isolated from traditional social service delivery
systems. It was felt that at present health, education, and
social service providers lack financial and other incentives
to provide comprehensive services so that innovative means
are needed for sharing national resources with these groups.

With these caveats in mind, the telecommunications

services packages developed in this study were designed to address problems within the present service delivery environment, fully realizing the need to adapt current delivery modes in come instances and supplement these modes through telecommunications in others. The focus has been on those services that are most amenable to ntegrated delivery and at the same time, are capable of delivery through telecommunications in a cost-effective manner. While the services within the packages may not contain any surprises, the innovative aspect is the packaging itself, in which several services can be delivered using the same technology, thus enhancing the potential of integrated service delivery.

A final point is that this report is addressed primarily to the service planners and providers and has therefore attempted to take into consideration as much as possible their specific concerns and research needs. It is hoped that this document achieves two purposes: First, it should demonstrate strongly the feasibility, utility, and effectiveness of telecommunications in various service delivery contexts; and second, it should assist in planning demonstrations of such approaches, especially in terms of evaluating the impact of the projects and ascertaining whether they should be established on a widespread and on-going basis.

In addition to this Executive Summary, the full report consists of a volume in which detailed discussions of the issues

are presented. The sections in this summary correspond in large part to the major chapters of the main report.

CONCEPTUAL APPROACH

The conceptual approach for this study was relatively straightforward in that the underlying question that we have attempted to answer is: "What are the needs for specific social services, and in what ways can telecommunications technology be utilized to meet these needs?" The focus of this question should not be overlooked. We have structured our study around the need for a given service or set of services, how well these services integrate with each other, and then, we have examined the possible technologies available for use. We feel that this "needs/services" approach is more appropriate than the "feasible technology" approach because it tends to deal more directly with the problem at hand and one is not tempted to search for needs simply because there is a technology that appears to work and that might have some useful application.

A further aspect of our approach has been the manner in which we have obtained our information. While it was not possible to perform a comprehensive needs assessment, nor use primary data sources for information regarding current projects, we have placed strong emphasis on the views of the service providers and the service recipients. Adherence to this approach led to a study that is weighted heavily in terms of the services themselves as opposed to the technology, and this is altogether appropriate.

The specific techniques employed in the determination of service needs consisted of a literature search of the projects utilizing telecommunications currently underway and those that have been conducted in the past, interviews with key people in the service delivery and telecommunications field, direct contact (by telephone) with several of the projects that were felt to prototypical of the types of applications possible, and the utilization of a Telecommunications Users Advisory Committee that was selected to represent the views of the service planner, the service provider, and the ultimate service recipient.

Examining specific projects currently in operation was done to achieve three goals: (1) To provide a detailed overview of the state of the art; (2) to isolate factors associated with successful and unsuccessful operations; and (3) to provide input for future site-specific planning.

The Telecommunications Users Advisory Committee's purpose was to generate input as to what services were needed and institutionally feasible in their environments. From the input of this Committee, we were able to provide both a broad interpretation of service needs and priorities and an identification of those aspects of current experiments that were crucial to the success or failure of the projects.

From this information, an initial list of potential service concepts was developed and criteria for service integration were applied to form clusters of services in the three areas of

health, education, and other social services, and the technologies most appropriate for placing these clusters into service packages. Furthermore, the hardware and system costs, as well as the institutional constraints upon service packages were considered. Influencing the service packages throughout were actual demonstration considerations and policy issues such as privacy, community control, regulatory policy and payment structures.

The actual methodology employed for the study is illusin Figure 1, and is discussed in greater detail in Chapter 2.0 of the main report.

A REVIEW OF CURRENT EXPERIMENTS

A review of current experimentation in adapting telecommunications technology to the fields of health, education, and social service delivery reveals a great diversity of program goals and objectives, target populations served and functions of the technologies. This is hardly surprising when we consider the many different ways telecommunication and information technology have been incorporated into the activities of everyday life. In the service delivery context, the technology has been utilized for resource-sharing between institutions, for professional interaction between service providers, for coordination of geographically separated institutions, to speed the flow of information between service

FIGURE 1

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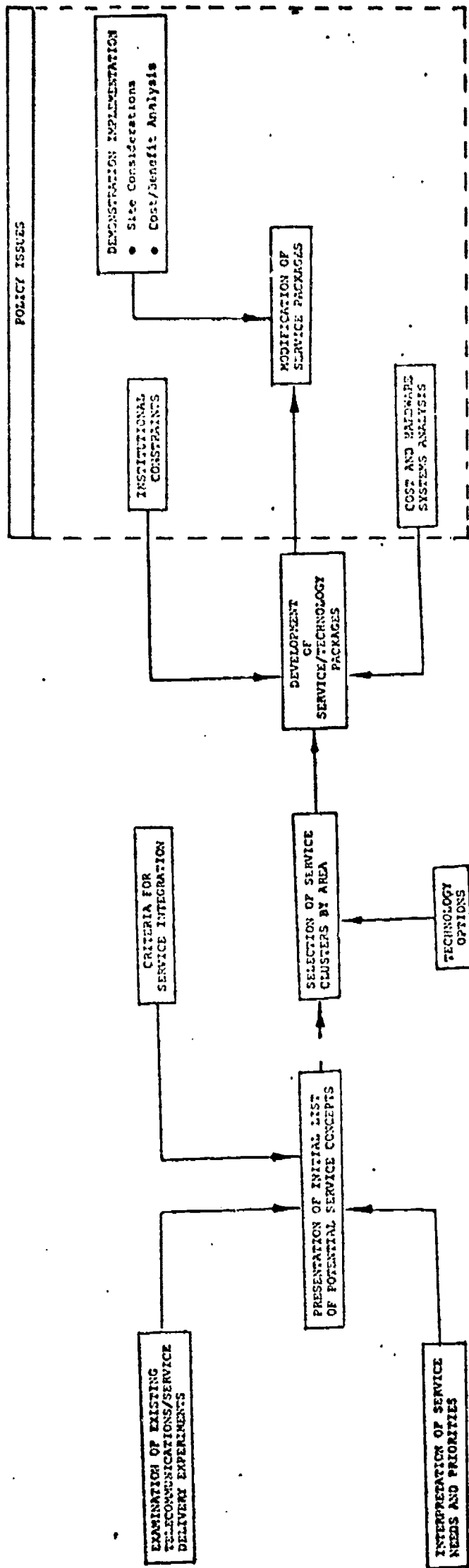
providers and service recipients, to reduce transportation needs, to deliver new and innovative services, to individualize services received, to save costs in service delivery, and for resources of many institutions may be shared through tele-communications. In addition, the whole television medium changes from being a broadcast medium which caters to mass needs to being a "narrowcast" medium which may be responsive to local and individual concerns, and which is available for participation by community members.

In this study, the purpose of examining this wide range of telecommunications experiments was to identify service possibilities and to gain a preliminary idea of the feasibility of the services, based on past success or failure.

Some of the most sophisticated telecommunications service delivery systems, utilizing two-way video transmission, have been pioneered in the area of health care. Telemedicine systems have been developed to serve medical needs of all sorts: Consultation; diagnosis; therapy; medical education and continuing medical education for professionals, management of hospital activities, and public health. Most projects involve multiple services, either because the system was designed to deliver multiple services or because once the system was installed, new service uses evolved.

In examining the various telemedicine projects, certain characteristics seemed to be frequently present. First, is the

experimental nature of the projects. These telemedicine projects
were introduced by certain innovative persons in each medical
institution, and these individuals faced the task of educating
the health care providers in th· use of the new technology.
Second, resistance in the medical field to the new technologies
comes from the natural fear of change and also because the
roles of the service providers are affected by the new systems.
Third, cost has been found to be a barrier in many projects.
The technology tends to be too expensive to be implemented
without outside financial assistance. Finally, an issue
which recurs in the telemedicine projects examined is the need
for health providers to identify areas of need which could be
met by telecommunications. Technological innovation must be
responsive to a real need. The success or failure of tele-
medicine planners to gain this information from health care
professionals will probably determine the success or failure
of telemedicine.

In the area of education, many of the current telecommu-
nications projects suggest that the role of the teacher may be
substantially changed in the future through the use of the
technology. First, computer management of routine tasks can
free the teacher for more personalized instruction. Testing
and grading may be delineated to the computer in the future,
as well as routinized teaching tasks such as drill-and-practice
sessions for which the computer may be easily programmed.

Secondly, the role of the teacher may change into one of resource manager. Just as education increasingly consists of learning how to locate information, the teacher may become one who teaches how to locate and utilize educational resources.

Just as the advent of telecommunications technology in general has the potential for changing our concept of institutionalized meeting places, so the institutions of education could potentially change drastically in organizational structure through the implementation of educational telecommunications systems. The conventional classroom, or even the home, could become a resource center connecting the individual to a variety of people and resources throughout the country and the world.

The field of social service delivery through telecommunications is one which still remains largely to be explored. The largest group of what one might term social service applications to date has consisted of public interest programming on cable television, addressing issues of interest to groups within the community and offering information of general usefulness on services and community affairs. Another group of applications is geared toward management information systems and involves organizing of social service data for greater accessibility by service recipients. In addition, there are services for special groups within the community who are particularly in need of social service delivery or who are isolated from conventional delivery mechanisms.

The experiments examined under this study suggest many services concepts and target populations. Particularly in a new field, it is most important to plan from the basis of whatever data is available on possible strengths and weaknesses of the type of service system being considered. In actual implementation of a service delivery system, it will be necessary to study in detail previous experiments containing as many relevant factors as can be determined. What this examination of current experimentation has shown is that successful telecommunications service delivery applications have been demonstrated in a wide variety of situations and have served an equally wide variety of needs. Of significant importance is the discovery that "human factors," such as professional and community acceptance and adjustment of work and life styles are often more critical to success than the sophistication or complete appropriateness of the telecommunications employed. Finally, no experiment is likely to succeed without a clear understanding of the needs associated with the services to be delivered and the establishment of clear objectives to meed these needs.

DEVELOPMENT OF INTEGRATED SERVICE PACKAGES

As stated in the introduction of this report, the overall purpose of the planning study was to explore ways in which communications technology may be used to enhance and extend delivery of public services and to create innovative and cost-effective means of service delivery. The results presented in

this report comprise the basis for planning of a demonstration which integrates a number of alternative delivery systems with several public service concepts.

The service concepts themselves have been developed from several different sources. First, other relevant studies on telecommunications and service delivery were examined. The goal of this study has been to build upon the previous work in the field and to expand upon such areas as cost-benefit analysis of telecommunications-based service delivery systems, institutional constraints involved in implementing such systems, and policy issues, particularly the issue of privacy. For this reason, service concepts outlined in previous significant planning documents in the field were reviewed and incorporated.[1] A second source of ideas for service concepts was demonstrations which are now being carried on in the field, ranging from local community-based projects to major Federally-funded demonstrations.

Another input to the generation of service concepts was the areas of concern originally stated by the Department of Health, Education, and Welfare for the study. The stated purpose

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1. For example, see Testing the Applicability of Existing Tele-communication Technology in the Administration and Delivery of Social Services, Mitre Corp., April 12, 1973, and Communications Technology for Urban Improvement, Committee on Telecommunications, National Academy of Engineering, June, 1971.

of the study was to:

> demonstrate appropriate roles for modern communi-
> cations technology in providing needed community
> information services to and among individuals, more
> relevant communications between individuals and
> government, and more effective delivery systems for
> health, education and social services.

Service Integration. The underlying logic upon which
integrated service delivery systems are based is that human
beings are faced with a variety of problems, rather than "pro-
blem areas" which can be dealt with in isolation.[1] Therefore,
a service delivery system which can solve client problems
should be comprehensive, coordinated, and integrated. Parti-
cularly on a local level, multi-service programs have been
found to be an effective method for meeting needs, because
most human problems involve a complexity of factors rather
than one categorical need. Integrated service delivery systems
allow the service provider to respond to a problem on a number
of different fronts. The objective of an integrated service
delivery system is to offer, either directly or by referral,
a range of services and activities to a given target population.
Telecommunications-based service delivery systems may make a
significant contribution to integrated service delivery because

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1. Comprehensive Neighborhood Programs: A Guidance Manual, p
prepared by Abt Associates for the Office of Economic Opportunity,
December, 1970, page 8.

of their potential for extending communications between various agencies, institutions and personnel without regard to geographic separation, thus allowing these agencies to work more profitably together.

For telecommunications-based service delivery projects, integrated service delivery has a number of special benefits. First, implementation of telecommunications systems usually involves large start-up costs in capital expenditure for the hardware. A system which is planned to meet several service needs will have a broader base for economic support as well as for other types of support. Second, the nature of telecommunications technology itself is to enhance interaction and to make communication more efficient and quick. Linkages between institutions or individuals who have never before communicated become possible, and communications between institutions or individuals who already work together are facilitated. In this way, more resources are made available to the service recipients.

Criteria for Service Integration. The success of an integrated service delivery system will depend largely upon the care with which services are chosen for combination with one another. The two most general schemes for integration of services are integration based on client needs and integration based on system requirements. Planning of a client-oriented system involves identifying a suitable target population, listing all the possible needs of that group, and then designing

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a system responding to all these services needs. The potential problem of such a system is that services for one group become institutionalized, and duplicative service-systems develop. In planning a system-oriented service integration system, similar staff, space, and other support functions are matched to determine suitable services to integrate. Most viable service integration schemes will combine parts of both these orientations, achieving a balance between the two.

Four major criteria for service integration for telecommunications-based service delivery systems have been identified:

- Similar service users
- Corresponding program objectives
- Co-location of services
- Staff skills and function overlap

These criteria are sufficiently broad for general planning for service integration in the present study. In planning for a specific site, however, more detailed criteria must be developed to fit the particular mix of needs and systems in that location.

The purpose of identifying similar service users corresponds to the preceding discussion of client needs-oriented service integration. In site-specific planning, the suitability of certain integrated service systems for a particular site may be based upon demographic data and community needs assessment.

Corresponding program objectives serve as another criteria

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for integration of services. Services with common objectives will tend to produce results which are mutually reinforcing, thus achieving the aforementioned goal of enriching service delivery through results caused by the interaction of services. Achievement of certain service delivery goals will advance other goals. Programs may have corresponding objectives in that they aim to raise the standard of living of one particular client group, or in that they are aimed at solving a problem which crosscuts many groups.

Co-location of services is a systems-oriented approach to service integration. The classic example of integrated service delivery in the past has been the neighborhood-based service center.[1] The neighborhood service center is organized for maximum accessibility through close geographical location; the potential of telecommunications, however, alters the necessity of geographical proximity. Thus, the concepts underlying the neighborhood integrated service system may be transferred to a telecommunications-based system.

Staff skills and function overlap is the fourth criterion for service integration. Staff capabilities are an operational consideration which, as in co-location of services, will be im-

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1. Comprehensive Neighborhood Programs: A Model with Three Applications, prepared by Abt Associates for the Office of Opportunity, December, 1970.

pacted by telecommunications links. For example, a neighbor-
hood service center might determine services to be delivered
on the basis of the multiple skills of a staff member. With
telecommunications, however, on-site staff members may involve
remote staff with a variety of additional skills in service
delivery. Thus staff skill becomes much less of a limiting
factor in the telecommunications system.

Application of Service Integration Criteria. The
services examined in this study are classified based, in gener-
al, on concurrence on two or more of the criteria. In some
cases, services with only one criterion in common are clustered
because of the importance of that single link. While the
distinction between health, education, and other social services
is maintained, it should be remembered that the ultimate service
packages suggested will cut across these service areas in sev-
eral instances.

Figure 2 is a matrix of the health services/service
integration criteria. Each cell entry indicates a fit between
the spedified health service and a service integration criterion
(note that the criteria have been broken up into sub-sets, thus
allowing for multiple entries of a particular service for a
given criteria). Figure 3 is a similar matrix for education
while Figure 4 is the matrix for other social services. In
examining the cell entries, it was possible to select clusters
for each service area that fit similar criteria in similar ways.
Figure 5 lists the resulting clusters by service areas.

Figure 2

Health Service Integration Matrix

Column group headings: Staff Skills and Functions Overlap · Co-location of Services · Corresponding Program Objectives · Similar Service Users

1. Public health information to the community
2. Teleconsultation
3. Nutrition information
4. Prenatal and infant care
5. Telemedicine applications using non-physicians
6. Speech therapy via telecommunications
7. Testing of sight and hearing
8. Videotape of ... diagnostic process for treatment and records
9. Patient monitoring
10. Computerized patient history
11. Computer data bank for medical information
12. Video medical history
13. Emergency medical network, involving fire, police, ambulances
14. Teleconsultation ...
15. Administrative services ... communications
16. Recording and ... of medical procedures for health students
17. ...
18. Patient entertainment via telecommunications
19. Pharmacy services via telecommunications
20. Psychiatric remote diagnosis
21. Teletherapy for mental patients
22. Computerized total hospital activities
23. Video grand rounds
24. Seminars via telecommunications
25. Patient education
26. Continuing education for medical professionals
27. Drug education
28. Videotapes for ... and self assessment
29. Video display of minor surgical activities such as dental and opthalmic procedures
30. Recording of psychiatric interviews for later group diagnosis
31. CAI for medical education

Figure 3

Education Service Integration Matrix

Column header groups:

- Staff Skills and Functions Overlap
  - Citizen involvement & community development
  - (illegible)
  - (illegible instruction)
  - (illegible)
  - Health Education
  - Knowledge of service delivery & research
  - Counseling and Psychiatric Social Work
  - Communications Technology

- Co-location of Services
  - Homes
  - Prisons
  - Neighborhood centers
  - Schools
  - Nursing homes
  - Hospitals

- Corresponding Program Objectives
  - Improved community health standard
  - Reduced Social Isolation
  - Increased Availability of Information
  - Improved "Quality of life"
  - Improved Education Level
  - Increased Community Involvement
  - Career Advancement
  - Public access and local origination

- Similar Service Users
  - Minorities
  - Public assistance recipients
  - Patients
  - Health administrators
  - Health professionals
  - Other socially isolated
  - Handicapped
  - Elderly
  - Youth
  - General community
  - Rural populations

Row labels (programs):

1. Adult education
2. High school equivalency courses
3. College course work offered in conjunction with particular universities
4. Career education
5. Early childhood development
6. Resource sharing among schools
7. Tutorial services
8. Open University
9. CAI for individualized instruction
10. Videotaping of children in educational setting for later viewing by parent and teacher
11. Education programs for drop-outs in community centers
12. Courses for those confined to the home: housewives, handicapped, elderly
13. Programs for the non English speaking
14. Student produced programs
15. Classroom self paced learning
16. Library Resource Sharing

Figure 4

Social Service Integration Matrix

Column groups (top to bottom):

Staff Skills and Functions Overlap
- Communications Technology
- Counseling and Psychiatric Social Work
- Knowledge of service agencies & resources
- Health Education
- Career information
- Curriculum development & instruction
- Family & career work
- Citizen involvement & community development

Co-location of Services
- Hospitals
- Nursing homes
- Schools
- Neighborhood centers
- Prisons
- Homes

Corresponding Program Objectives
- Public access and local origination
- Career Advancement
- Increased Community Involvement
- Improved Education Level
- Improved "Quality of life"
- Increased Availability of Information
- Reduced Social Isolation
- Improved community health standard

Similar Service Users
- Rural populations
- General community
- Youth
- Elderly
- Handicapped
- Other socially isolated
- Health professionals
- Health administrators
- Patients
- Public assistance recipients
- Minorities

Rows (services):

1. Determination of eligibility
2. Repetitive learning for handicapped or retarded
3. Maintaining and updating records
4. Administrative coordination using telecommunications group conferencing
5. Decentralized social service centers
6. Hotlines for referral and counseling
7. Twenty four hour service centers
8. Crisis intervention
9. Client involvement in social service decision-making
10. Coordination of ... status and regions for planning
11. Social service information to general public
12. Reduced social isolation of the elderly
13. Social service information for the elderly
14. Rehabilitative programs for the handicapped
15. Employment referral and information
16. Counseling services
17. Family planning
18. Youth diversion ... delinquency prevention
19. Specific service referral from neighborhood centers
20. Neighborhood information
21. Centralized referral from home inquiry
22. Cultural access and expression
23. Public affairs information
24. Electronic town hall
25. Electronic Soapbox
26. Citizen referenda
27. Video literacy workshops
28. Community video center
29. Community outreach
30. Information on rights and anti-discrimination procedures
31. Information dissemination to welfare recipients
32. Cultural programming for the handicapped
33. "Life Coping" skills
34. Vocation training

Figure 5

Health Service Clusters

Cluster A	Cluster B	Cluster C	Cluster D	Cluster E	Cluster F	Cluster 5
Public Health Information to the Community; Nutrition Information; Pharmacy Service; Drug Education	Te computation and Diagnosis; Telemedicine Applications Using Non-Physicians; Telecomputation to Patients; Automated Staff Interaction; Physician Premise Diagnosis; Technology for Stroke Patients; Patient-observed Interview for term Stroke Diagnosis	Prenatal and Infant Care; Speech Therapy; Testing of Patient Hearing; Telemedicine Using Non-Physicians	Videotape of Rehabilitative Process for Treatment and Records; Recording and Transmitting of Medical Procedure for Heart Students; Air to Grand Rounds Seminars; Continuing Education for Medical Professionals; Videotape for Professional Self-Assessment; Videotape Display of Minor Surgical Activities such as Dental and Ophthalmic Procedures; CAI for Medical Education	Patient Monitoring; Patient Visiting; Patient Entertainment; Patient Education	Computerized Patient History; Computerized Data Bank for Medical Information; Video Medical Library; Computerized Hospital Admission; CAI for Medical Education	Emergency Medical Network

Education Service Clusters

Cluster A	Cluster B	Cluster C	Cluster D	Cluster E
Adult Education; Career Education; Courses for Those Confined to the home	High School Equivalency Courses; Career Education; Tutorial Service; Educational Programs for Drop Outs in Community Centers; Education Programs for the Non-English Speaking	College Course Work Offered in Conjunction with Universities; Tutorial Services; Open University; CAI for Individualized Instructions; Classroom Self-Paced Learning; Student Produced Programming	Early Childhood Development; Videotape of Children in Education Setting for later Viewing by Parent and Teacher; Student Produced Programming	Resource Sharing Among Schools; Resource Sharing Among Libraries

Social Service Clusters

Cluster A	Cluster B	Cluster C	Cluster D	Cluster E	Cluster F
Determination of Service Eligibility; Maintaining and Updating Records; Decentralized Social Service Centers; Regional Coordination of Social Service Agencies; Administrative Coordination Using Teleconference Group Conferences; Client Involvement in Social Service Decision Making	Preventive Learning for Handicapped or Retarded; Reduced Social Isolation of the Elderly; Rehabilitative Services for the Handicapped; Family Planning; Cultural Programming for the Handicapped; "Life Coping" Skills	Social Service Information to General Public; Social Service Information for the Elderly; Employment Referrals and Information; Neighborhood Information; Public Affairs Information; Information on Budget and Anti... ; Information on ... to Welfare Recipients	Youth Development and Delinquency Prevention; Family Planning; Counseling Services; Community Outreach; Vocational Training; "Life Coping" Skills	Specific Service Referral from Neighborhood Centers; Hot Lines for Personal and Counseling; Twenty-Four Hour Service Centers; Crisis Intervention; Employment Referrals and Information; Centralized Referral from Home Inquiry; Community Outreach	Cultural Access and Expression; Public Affairs Information; Electronic Town Hall; Electronic Suggestion; Citizen Referrals; Video Literacy Workshop; Community Video Center; Client Involvement in Social Service Decision Making

Telecommunications Technology and Service Cluster

Linkages. A key step in the development of service packages
is the linking of the service clusters with the technological
options available. Figures 6, 7 and 8 present technology
matrices for the areas of health, education, and other social
services respectively.

A closer look at the cell entries in the above figures
gives some idea of the potential for each of the technologies
to provide the services in the given clusters. It is readily
apparent that videotape is an appropriate technology for one-way
dissemination of general information that can be used over and
over again. This is true for hospitals, schools, and neighbor-
hood centers. Another technology that has an application across
service areas is the telephone, either in conjunction with a
computerized referral network, or for providing audio or digital
upstream information in a one-way CATV system.

The next step in the development of the packages" is to
eliminate those services/technology combinations that are not
best suited for the delivery of the service and to combine those
combinations that are both highly suited to delivery and allow
optimal flexibility in delivering other clusters of services,
through adaption of other telecommunications hardware.

PROPOSED SERVICE/TECHNOLOGY PACKAGES

The service/technology packages presented on the following
pages have been developed in accordance with the criteria for

Figure 6

Telecommunications Technology/ Health Clusters

	Videotape	Telephone	Radio Broadcast	Television Broadcast	Closed Circuit TV	One-Way CATV	One-Way CATV with Telephone	Two-Way CATV with Digital Response	Two-Way CATV with Audio Response	Two Way CATV with Full Video	Computers	Facsimile Transmission
A. Public Health Information	●	●	●	●		●						
Nutrition Information	●	●	●	●		●						
Pharmacy Services		●			●		●		●	●		
Drug Education	●	●	●	●		●						
B. Teleconsultation and Diagnosis					●		●		●	●		
Telemedicine Applications Using Non-Physicians		●					●		●	●		
Teleconsultation to Prisons					●		●		●	●		
Administrative Staff Interaction		●			●		●	●	●	●		●
Psychiatric Remote Diagnosis		●			●							
Teletherapy for Mental Patients		●			●							
Recording of Psychiatric Interviews for Later Group Diagnosis	●											
C. Prenatal and Infant Care		●			●		●		●	●		
Speech Therapy					●				●	●		
Testing of Sight and Hearing					●	●	●		●	●		
Telemedicine Using Non-Physicians		●					●		●	●		
D. Videotape of Rehabilitation Process for Treatment and Records	●											
Recording of Medical Procedures for Health Students	●										●	
Video Grand Rounds						●	●		●	●		
Seminars					●	●	●		●			
Continuing Education for Medical Professionals							●					
Videotapes for Professional Self-Assessment												
Video Displays of Minute Surgical Activities such as Dental and Opthalmic Procedures					●	●			●	●		
CAI for Medical Education											●	
E. Patient Monitoring					●	●						
Patient Visiting		●			●		●		●	●		
Patient Entertainment	●		●	●	●	●						
Patient Education	●		●	●	●	●						
F. Computerized Patient History											●	
Computerized Data Bank for Medical Information											●	
Video Medical Library	●										●	
Computerized Hospital Activities											●	
CAI for Medical Education											●	
G. Emergency Medical Network		●					●		●	●		

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Figure 7

Telecommunications Technology / Education Clusters

	Videotape	Telephone	Radio Broadcast	TV Broadcast	Closed Circuit TV	One-Way CATV	One-Way CATV with Telephone	Two-Way CATV with Digital Response	Two-Way CATV with Audio Response	Two-Way CATV with Full Video	Computers	Facsimile Transmission
A. ● Adult Education	●		●	●	●	●	●	●				
● Career Education	●		●	●	●	●						
● Courses for Those Confined to the Home				●		●	●	●	●			
B. ● High School Equivalency Courses				●	●	●						
● Career Education	●		●	●	●	●	●					
● Tutorial Services	●	●					●	●	●		●	
● Educational Programs for Drop Outs in Community Centers	●					●	●			●	●	
● Educational Programs for the Non-English Speaking					●	●	●			●	●	
C. ● College Course Work with Linkage of Universities					●		●			●		
● Tutorial Services	●	●					●	●	●		●	
● Open University	●						●	●	●	●	●	●
● CAI for Individual Instruction									●		●	
● Classroom Self-Paced Learning	●				●						●	
● Student Produced Programs	●				●	●						
B. ● Early Childhood Development	●				●					●		
● Videotape of Children in Educational Setting for Later Viewing by Parent and Teacher												
● Student Produced Programming					●	●						
E. ● Resource-Sharing Among Schools	●	●								●	●	●
● Resource-Sharing Among Libraries	●	●								●	●	●

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Figure 8

Telecommunications Technology / Social Service Clusters

	Videotape	Telephone	Radio Broadcast	Television Broadcast	Close Circuit TV	One-Way CATV	One-Way CATV with Telephone	Two-Way CATV with Digital Response	Two-Way CATV with Audio Response	Two-Way CATV with Full Video	Computer	Facsimile Transmission
A. Determination of Service Availability		●									●	
Maintaining and Updating Records											●	
Coordination of Social Service Agencies		●									●	
Administrative Coordination Using Telecommunications for Group Conferencing		●					●		●	●	●	●
Client Involvement in Social Service Decision-Making							●	●	●	●		
B. Repetitive Learning for Handicapped or Retarded	●					●		●	●	●		
Reduced Social Isolation of the Elderly	●	●	●	●		●				●		
Rehabilitative Services for the Handicapped	●				●			●		●		
Family Planning	●			●	●	●						
Cultural Access and Expression	●		●	●		●	●					
Cultural Programming for the Handicapped	●			●		●	●					
"Life-Coping" Skills	●			●		●	●		●			
C. Social Service Information to General Public	●	●	●	●		●	●					
Social Service Information for the Elderly	●	●	●	●		●	●					
Employment Referrals and Information		●		●		●	●					
Neighborhood Information	●	●	●	●		●	●					
Public Affairs Information		●	●	●		●	●					
Information on Rights and Anti-Discrimination Procedures		●	●	●		●	●					
Information Dissemination to Welfare Recipients		●	●	●		●	●					
D. Youth Development and Delinquency Prevention							●		●	●		
Family Planning	●			●	●	●						
Counseling Services		●							●	●		
Community Outreach			●	●		●						
Vocational Training	●			●		●				●		
"Life-Coping" Skills	●			●		●	●		●			
E. Specific Service Referrals from Neighborhood Centers		●					●		●	●		
Hotlines for Referrals and Counseling		●							●	●		
24 Hour Service Center		●					●		●	●		
Crisis Intervention		●					●		●	●		
Centralized Referral from Home Inquiry		●										
Community Outreach			●	●		●						
F. Cultural Access and Expression	●		●	●		●	●					
Public Affairs Information		●	●	●		●	●					
Electronic Town Hall							●		●	●		
Electronic Soapbox						●			●	●		
Citizen Referenda							●	●	●	●		
Video Literacy Workshops	●					●						
Community Video Center	●					●						
Client Involvement in Social Service Decision-Making							●	●	●	●		

service integration previously discussed. The seven packages
are also all responsive to the following three considerations:

- The need for demonstration of the service/technology
  mix

- The ability of the package to provide a variety of
  services using one or two compatible technologies

- The extent to which the service packages are flexi-
  ble and may be expanded in a modular fashion

Service Package A: Hospital Services Using Videotape
and Computers. This service package may be instituted within a
single hospital or medical center, although the computer data might
be transferred to another outlying health facility. The services
to be delivered basically involve recording and organizing of
medical data through the use of videotape and computers. The
following services, which include parts of various health and
social service clusters, may be delivered through such a system.

- Recording of psychiatric interviews for later group
  diagnosis

- Videotape of rehabilitative process for treatment
  and records

- Recording of medical procedures for health students

- CAI in medical education

- Computerized patient history

- Computerized data bank for medical information

- Video medical library

- Computerized hospital activities

- Public health information

- Nutrition information

- Drug education

- Rehabilitative services for the handicapped

- Family planning

- Determination of (health) service availability

- Coordination of (health) agencies

Service Package B: Service Referral Computer Data Bank
With Telephone Access. A centralized source of referrals to ser-
vices may be demonstrated as a service/technology package in
itself or as a component of other service networks. These ser-
vices could be delivered through a data bank accessed by community
members via telephone:

- Determination of service availability

- Maintaining and updating records

- Coordination of social service agencies

- Social service information to the general public

- Employment referrals and information

- Neighborhood information

- Public affairs information

- Information on rights and anti-discrimination
  procedures

- Information to welfare recipients

- Hotlines for referral and counseling

- 24-hour service centers

- Crisis intervention

- Centralized referral from home inquiry

- Public health information

- Nutrition information

- Pharmacy services

- Drug education

Service Package C: Community Involvement Project
Using One-Way Cable Television. In this service/technology
package, the concept of the community video center is expanded
to include greater dissemination of programming through a com-
munity cable television center. The community cable television
project is based upon the idea that television may be used as a
medium for community members to express and exchange ideas. A
community center with equipment and technical assistance avail-
able to community members to produce their own programming and
a channel or channels reserved for this public access programming
are the necessary components of this community involvement
service/technology package. The following services may be
delivered:

- Cultural access and expression

- Public affairs information

- Electronic soap box

- Video literacy workshops

- Community video center

- Community outreach

- "Life-coping" skills

- Neighborhood information

- Reduce the social isolation of the elderly

- Cultural programming for and by the handicapped

- Student-produced programming

Service Package D: Educational Services Delivered
Through One-Way Cable Television with Call-Back Capacity. Cable
links to institutions such as industrial sites, nursing homes,
prisons, hospitals, neighborhood centers, and homes enable indi-
viduals to receive instruction without having to travel to a
centralized educational facility. Telephones may be used to
provide a student capability for question-asking. The chief
advantage of this service/technology package is that it increases
the accessibility of education, thus allowing adults and non-
traditional students to receive instruction. The followint
services are possible in this service/technology package:

- Adult education

- Courses for those confined to the home

- Open University

- Continuing medical education

- Careet education

Although the list of services is short, each service listed here addresses a range of possible subject matter and a large target population. Therefore, these services have been considered adequate in themselves to constitute a service package.

The logical technological extension of this service/technology package is full two-way video transmission between institutions previously linked with one-way cable and telephone call-back.

Service Technology Package E: Innovative Classroom Education with Computer and Closed-Circuit Television. Increased awareness of the special needs of each student in a traditional classroom setting makes a service/technology package such as this one valuable to educators. Computers may be used to free the teacher from routinized tasks and to provide individually-paced learning for each student. Closed-circuit television is used to increase the resources available to the classroom teacher. The following services may be delivered in the classroom using these technologies:

- Classroom self-paced learning
- Computer-assisted instructions
- Studen' produced programs
- Resource-sharing among schools
- Resource-sharing among libraries
- Career education
- Educational programs for the non-English speaking

Once programming is developed to deliver these ser-
vices, it may be widely employed by many schools. Programs may
be distributed by mail to a number of schools, or, it the
schools are linked through telecommunications at a later date,
may be transmitted by cable. Libraries may also develop pro-
gramming to be shown within schools. High quality software forms
the basis for success of this service/technology package.

Service package F: Interactive Television for Educa-
tion and Social Service Delivery in the Home. Interactive
television refers here to a system in which the viewer receives
video programming, or slide programming using a frame-grabber
and has a digital response capability. This technological
system constitutes the most sophisticated television system
which may now be implemented in the home, due to bandwidth
constraints. If a home viewer has full two-way video capa-
bility, one channel of spectrum space is required. Even in a
system with 25 to 40 channels, the bandwidth is inadequate to
support this two-way video service to an entire community.
Frame-grabbing is a method whereby many viewers may share one
channel, and hence it is most appropriate for home use.

The interactive capability basically gives the viewer
the opportunity to make requests and to control the direction
of the program through his or her responses. The viewer also
has the opportunity to express opinions through the electronic

polling capability. The following services are suitable for delivery in this mode.

- Adult education
- Courses for those confined to the home
- Tutorial services
- CAI for individual instruction
- Open university
- Client involvement in social service decision-making
- Repetitive learning for the handicapped or retarded
- Rehabilitative services for the handicapped
- Citizen referenda

As in service/technology Package E, development of high-quality software is crucial to the success of such services. Collaboration between curriculum developers, television programmers, and computer programmers is necessary to insure that balanced, useful programs are developed. This service/technology package will be particularly valuable to home-confined groups such as housewives, the elderly, and the handicapped.

Service Package G: Two-Way Institutional Network for Communication and Resource-Sharing. A point-to-point network connecting major service delivery institutions is the most suitable application for two-way video transmission. A number of previous experiments have connected pairs of institutions in this way, and the more the network is expanded to include dif-

ferent types of service institutions, the more possibilities
for integrated service delivery systems will arise. The
following services can be delivered over such a system:

- Telemedicine applications using non-physicians
- Teleconsultation and telediagnosis
- Teleconsultation to prisons
- Administrative staff interaction
- Pharmacy services
- Prenatal and infant care
- Speech therapy
- Testing of sight and hearing
- Video grand rounds
- Video displays of minute surgical procedures such
  as dental and opthalmic procedures
- Patient visiting
- Emergency medical network
- College course work with linkage of universities
- Resource-sharing between schools
- Resource-sharing between libraries
- Reduce social isolation of the elderly
- Rehabilitative services for the handicapped
- Counseling
- Vocational training
- Specific service referrals from neighborhood centers
- 24-hour service center

- Crisis intervention

- Electronic town hall

- Electronic soap box

Inclusions of various types of service institutions will suggest services beyond this list as well. This service/ technology package is extremely comprehensive, and previously-suggested service/technology packages could function as one component of this city-wide or regional network of service institutions. The possible institutions in such a network include major medical centers, neighborhood health clinics, nursing homes, health professions, schools, universities, prisons, libraries, social service agencies, and others to be determined on the basis of specific sites.

COST AND HARDWARE SYSTEMS

We will not attempt to go into detail in terms of hardware and costs in this summary. A detailed analysis, including costs can be found in the main report. However, there are some points that should be made.

A large number of experiments or demonstrations are presently in existence, in schools, hospitals, social service agencies, and community centers around the nation. Many of these have been carefully conceived, well designed, and efficiently executed; some have not. But in the aggregate they have shown clearly the potential for telecommunications in generating new services and in reducing the cost of more traditional ones. These experiments

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have been performed with diverse equipment, under diverse conditions, and under diverse managements; in many cases they have been patched on to existing programs or existing telecommunications facilities.

It would appear that the need exists to standardize some of the more successful experiments in a way which would permit comparisons among them on the basis of cost and effectiveness, and replication of the surviving ones nationwide. In addition, it appears likely that economies of scale could be achieved by integrating a number of such experiments into a single demonstration system, allowing them to share common facilities and a common management.

The major systems examined in this study included videotape and teleprocessing systems using one-way and two-way CATV and computers with dial access.

In addition to the description of the hardware involved in the systems, the study examined briefly the incidence of costs, system capabilities, subscriber penetration, rate of return, and maintenance allowances.

What became most obvious is that assembling a working system is . ch more complex than simply ordering the parts and components checked and plugging them together. While the approach of linear addition of components employed in this study is useful for costing purposes, it ignores necessary equipment and expenses for subsystem interfacing, system integration, etc Inclusion of all of these in detail would be necessary for specific system design in demonstration sites.

INSTITUTIONAL RELATIONSHIPS AND CONSTRAINTS[1]

In examining the institutional relationships involved in the introduction of integrated service delivery through telecommunications technology, one must first look at the institutional resistance to such an introduction. That is, what resistance will new service delivery modes encounter from existing institutions and institutional personnel? On the other hand, one must also look at the nature of institutional acceptance (passive) or institutional change (dynamic), where the institutions feel that the application of telecommunications enhances their overall effectiveness and thus becomes a stimulus for institutional development and growth.

Potential of institutional cooperation has been considered in developing the demonstration design and subsequent service packages. Too often, opportunities for cooperative interaction between institutions and possibilities of networking and sharing of costs and resources are overlooked through too heavy a focus in the planning phase on overcoming anticipated institutional resistance that never materializes.

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[1] Many of the institutional constraints and considerations presented herein are based on two meetings of a Telecommunications User Advisory Committee (TUAC). This committee was created and convened by an Abt Associates subcontractor, Public Technology, Incorporated, to identify in general terms those social services that should be considered for experimental delivery. The TUAC also discussed several concerns and constraints, regarding this method of social service delivery, which affects institutions, their clients, and the general population. Committee membership included medical personnel, social service administrators, social service planners, computer and telecommunications experts, educators, minority representatives, and local government administrators. (See Appendix A for a listing of participants on the Committee).

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However, there are several general institutional constraints
that would be encountered in establishing and implementing a
demonstration, regardless of whether the demonstration focuses
on aspects of health, education, or other social services. These
constraints can be broadly categorized into six overlapping areas
of consideration. These areas are:

- organizational considerations;
- territorial considerations;
- personnel considerations;
- information considerations;
- economic considerations; and
- service product considerations.

Organizational considerations relate to institutional
acceptance of new service delivery modes. Territorial considerations
involve concerns of new individuals and new areas of skills replacing
or working in conjunction with traditional service delivery types.
This would be especially true in rural areas where the influx of
new telecommunications service delivery will invariably imply new
and different faces living in these areas. Personnel considerations
are more directly manifested in unions and other trade associations.
Furthermore, the professionals involved in service deliveyr in the
traditional way are not immune to concern with rapid technologi:al
change. Lack of complete understanding of the new telecommunications
applications, a feeling that their skills may not be readily trans-
ferrable, and a need to learn new management techniques to meet
the needs of the new technology and new personnel may cause the
professionals in some cases to impose barriers to the demonstration.

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Information considerations deal primarily with the need to establish adequate "protocols" to be employed in using the new system of service delivery. Such protocols would have to take into consideration the question of "communications etiquette" that would have long been established in the institutions. Economic considerations range from the problem of restructuring wage scales to correspond to the redefinition of job roles and responsibilities that would result from the telecommunications service delivery system to the problem of "copyright" or residual payment of stored software material.

Service product considerations raise several important issues of potential institutional constraints. The most widespread is the issue of accreditation of certain personnel in the delivery of the services. What is involved, particularly in the health field, is the transition of critical functions and the way in which both institutions and service recipients will respond to and participate in this transition.

Aside from the basic institutional constraints discussed above, there will be various jurisdictional, legal and regulatory constraints imposed on the HEW telecommunications experiments. Obviously a major set will be those imposed by the Federal Communications Commission (FCC). The FCC rules affect broadband cable television, telephone, and over-the-air broadcast transmissions. Therefore, the cooperation of this federal agency will be a basic requirement.

IMPLEMENTATION OF DEMONSTRATIONS

A major barrier to effective planning studies,is the
lack of appropriate or site-specific information from which to
develop workable programs. Therefore, the following items are
suggested as essential to any meaningful follow-on study of
telecommunications for social service delivery which aims toward
the possibility for a demonstration, in approximately the order
given:

- A clear definition of the target area (including
  geographic size, demographics, existing telecommunica-
  tions systems, etc.);

- A clearly defined service need assessment for the area
  (compiled primarily by social service delivery personnel,
  not technical personnel);

- Selection of the service package (s) appropriate to
  fill the specified needs;

- A detailed engineering specification of the telecommunica-
  tions system(s) required to implement the service
  package (s);

- A detailed cost/benefit analysis of demonstration impact.

Furthermore, the particular service packages, target
populations, and geographic locations chosen for the future
telecommunications demonstration projects will in many ways
determine the success of the projects and the likelihood that
they will catalyze further change. It is therefore critical that
a means be developed through which wise demonstration choices can
be made. The initial phase of the decision process would examine

more detailed data on each of the potential packages, and choose
among them based upon the preferences of the policy-maker as
well as upon a more detailed relative evaluation of the packages
themselves against specific site criteria.

Perhaps the most important and most difficult criterion
to apply to the choice of service packages for demonstration is
the criterion that the service be one for which a significant
need exists. The criterion that the packages of services selected
for the future demonstrations be economically efficient is
conceptually clear, but difficult to apply, given difficulties
in estimating costs and benefits of potential projects. In
particular, the question is not so much whether a new service can
be provided to meet an unmet need as whether the existing service
can be provided more efficiently in that site. Social, political,
and legal constraints provide a rich field for consideration, as
various groups within a site will have diverse attitudes toward
what comprise relevant social and political constraints. Legal
constraints will be more clear-cut; however, it may be expected
that some changes will ensure due to the impact of telecommunications
in this field Social and political constraints will deal with
issues such as the attitude of the service recipients to the
delivery system.

COST/BENEFIT CONSIDERATIONS

The fact that our cost/benefit analysis will be performed in order to determine optimal demonstration packages may require modification of our cost/benefit methodology presented in Chapter 8.0 of the main report in three distinct ways.

First, insofar as a demonstration, as opposed to long-range service delivery, may involve special payments mechanisms and special actors and actor relationships, it is critical to identify who, in the long run, is expected to pay for the telecommunications system and who is expected to benefit from the telecommunications system. The reason is that, if the parties who pay and the parties who benefit are different, then it is quite possible that the "payees" may, in fact, have no incentive to pay.

For example, a municipality that is interested in providing the present level of services at minimum cost may not find the additional benefit from citizen's time saved to be a persuasive argument in favor of telecommunications delivery unless the new system also reduces the total cost of service. Similarly, the external benefits of reducing congestion by cable deliveyr of university courses will not be considered by the university administrator in deciding whether to employ the cable system.

Second, it is probable that demonstration delivery will not entirely replace conventional service delivery. Many families, not involved in the demonstration, will require

conventional service delivery. In these cases, benefits from the new system must be compared with the costs of both the new and the old systems. For example, if facsimile mail service existed for a portion of the mail market and conventional mail service existed for the remainder of the market, the cost of serving the market using the new system must be compared with what it would cost to serve that portion by conventional means. (The total cost of the new system would have to be less than the additional variable cost of serving the new market by conventional delivery.)

A third and final point is that, for this demonstration, the cost-benefit analysis may not be able to estimate benefits over the life of the system or the life of the service, but rather, the analysis may extend only through the life of the demonstration. Thus, as well as providing high returns, the service packages must, during the demonstration life span, demonstrate some level of cost-effectiveness.

POLICY ISSUES

Several policy issues are important to consider at
this juncture in terms of developing telecommunications
demonstrations. Of prime importance is the issue of privacy
that has so frequently been referred to in this report. A
related issue is that of community control. A third policy
issue is regulatory behavior, and a final major policy con-
sideration is payment for services. Each of these is
important in that governmental behavior on the legislative,
judicial, or regulatory front will have grave impact on the
scope and nature of service delivery via telecommunications.

Privacy

Throughout this study, concern has been expressed
with regard to the potential for loss of privacy and violation
of civil liberties implicit in many telecommunications
applications. Particularly in areas where centralized personal
files are suggested to facilitate service delivery, the poten-
tial for unauthorized access to records in large. Furthermore,
the increased utilization of two-way CATV in the home (should
it be facilitated by one of the demonstrations) provides
another communications link that is capable of being inter-
cepted or "eavesdropped" on for improper purposes.

Certain obvious precautions must be taken in the
compiling of computerized information on individuals. Access
to the information must be strictly controlled -- although it
seems unlikely that any municipality will deny access to

individual records by a Federal government that seeks it in
the name of "national security." It has also been suggested
that individuals should have access to their own computerized
personal data and should have a right to challenge the contents.
Formidable problems nevertheless remain to be dealt with
through legislation and through civic vigilance as the
technology comes into increasing use.

In terms of two-way CATV message interception, the
answer probably lies in more stringent laws against invasion
of privacy in general, with specific reference to the new
problems brought about by cable technology. In addition,
scrambling devices and other technological safeguards can be
required as part of systems in which the possibility of such
misuse is a strong possibility.

Community Control

An additional safeguard against invasion of privacy
is that the control of the system be in the hands of the
user -- i.e., community control. Community control is not
a new issue, but both the potential usefulness of telecommuni-
cations technology in providing new and improved services to
the community and the potential dangers inherent in the
encroachment of such technology upon the unaware make the issue
of system control a very sensitive one. Local communities,
particularly minority communities, had have little access to
the media; and cable and other new telecommunications tech-
nologies might serve as a vehicle through which the views

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of these communities are expressed. However, for this to
occur, adequate access must be made available. The only
sure way that such access will be available is for the
communities to exercise a strong voice in the governance of
the communications systems in their areas. Whether this will
occur or not in the near future is a question of serious debate.
The local policy review board suggested in Chapter 6.0 may
be the type of group that could leverage adequate community
power to achieve some degree of influence in the determination
of policy.

Federal Regulatory Policy

Federal regulatory policy toward telecommunications
has only marginally focused upon social service delivery via
telecommunications. Instead, the overriding bulk of regulatory
policy has been devoted to the competitive struggle between
over-the-air television and CATV for the rights to the tele-
vision entertainment medium (educational and local origina-
tion program requirements not withstanding). In a real sense,
however, the struggle of CATV, and the regulatory posture which
has limited its present penetration, have crucial implications
for the development of telecommunications-based social-service
deivery system. For the most part, any large-scale scheme
of telecommunications social service delivery is dependent
upon a pervasive cable mandate with a concomitant large-scale
penetration rate. So long as FCC regulatory policy effectively
prohibits cable from entering primary U.S. markets and

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consequently limits total cable penetration to under 15%
the entertainment-established base of potential tele-
communications-delivered social service users will remain
too small to justify the formidable hardware expense of
wiring a community. Unless Federal cable policy becomes
more supportive of CATV and less protective of commercial
over-the-air interests, we predict that social service
delivery via telecommunications will be constrained to
demonstrations at a few CATV sites and to limited point-
to-point institutional linkages.

The previous conclusions, however, are not necessarily
critical of present (relatively restrictive) regulatory
policies regarding CATV. Whether the large-scale development
of CATV is warranted, either as an entertainment medium or
as a social service medium or both, is a highly complex
issue well beyond the capabilities of this study to attempt
to deal with. More importantly, Federal regulatory policy
towards CATV does not inhibit other telecommunications
technologies such as videocassette and telephone-based
systems. In a sense, regulatory constraints on CATV might
be interpreted as residual support for these alternative
telecommunications technologies. In any event, regulatory
issues will shape, to a large extent, whether telecommuni-
cations in general will have wide spread applications in
service delivery, and if so, which specific telecommunica-
tions technologies will be likely to be utilized for such
purposes.

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Payment for Services

Critical in all the future telecommunications experiments is the issue of paying for the services in an on-going, viable manner. The key to payment will be perceived value on the part of the user, and cost-benefit improvements on the part of the service provider. Where broadband, television signals are used to provide the service, one will have to change the attitudes regarding television receivers. For a user in the general population to consider paying for certain services delivered by CATV, that person must view the receiver as more than just an entertainment medium. One might adopt selective or marketing practices to sell certain social services delivery. Such practices would seek to increase the overall market for CATV by adding on select audiences, where the profit is a marginal or increment contribution to the whole.

However, certain social services can only be paid out of general tax funds collected at the federal, state or local level. Under the present circumstances of tight budgets and resistance to increased taxation, payment will amount to a re-allocation of public sector resources. For such reallocation to occur, the service provider must perceive a clear benefit in either costs or benefits, while the user must be willing to accept the changes. Here the role of a local policy review board will be critical. This board must assure that the new services are what the service

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clients want and can accept. Furthermore, where service users have an opportunity to influence the way public funds are spent on social service delivery, change in the overall system of delivery will be made possible.

Appendix A

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